REMARKS

Applicants respectfully thank the Board and the Examiner for their consideration of the present application.

The Board looked favorably on the Applicants' position regarding the obviousness rejections reviewed upon appeal and the Board reversed the Examiner on both grounds. However, the Board elicited new grounds of rejection which are addressed here for consideration by the Examiner.

To briefly summarize the Board's Decision, the Board agreed with Applicants' that the materials of the secondary references could not be swapped into the systems claimed by Applicants to provide a functional resistometric sensor material due to the very different selection materials and sensor systems (see, e.g., the Decision on Appeal, mailed Feb. 24, 2010, pages 14-18).

The Board has set forth alternative grounds of rejection that are described and argued below. Accordingly, the following remarks are in response to the New Grounds of Rejection set forth in the Decision on Appeal at page 18.

No claims have been canceled. Certain claims have been amended. Support for the amendments can be found throughout the specification as filed (see, e.g., page 25, lines 20-24, page 27, lines 1-4). No new matter is believed to have been introduced.

Briefly, it is important to understand that "doping" with a material is not the same as a "region" of a material. Doping refers to the change in the specific electrical property of a polymer material. Doping is usually performed to modify the pi electron in a polymer. As a result a lonely electron of a double bond, from which an electron was removed due to the doping, can move easily. As a consequence, the double bond successively moves along the polymer backbone. The positive charge, on the other hand, is fixed by electrostatic attraction to the doping agent, which does not move so readily. Accordingly, "doping" is not the same as a mixture or regions of different material. As demonstrated by the specification, both doped and undoped polymers (see, page 27, lines 1-4) can be used in combination with a compositionally different conducting material.

Furthermore, the "regions" or alternating regions or interpenetrating regions are spaced apart from one another (i.e., the similar materials are spaced apart) in

about 10-1000 angstrom distances. The fact that the regions of material are "spaced" also demonstrates that differences in "doping" (i.e., dopants are integrally part of the polymer backbone).

I. REJECTION UNDER 35 U.S.C. §103

Claims 98, 104-106, 108, 126-128, 148 and 152 stand rejected under 35 U.S.C. §103 as allegedly unpatentable over the combined teachings of Gibson, Barisci and Casella.

Claims 98, 104, 105, 108, 126-128, 148 and 152 stand rejected under 35 U.S.C. §103 as allegedly unpatentable over the combined teachings of Gibson, Barisci and Thackeray.

Claims 104, 105, 108, 126-128, 148 and 152 stand rejected under 35 U.S.C. §103 as allegedly unpatentable over the combined teachings of Gibson, Barisci and Naarmann. Applicants respectfully traverse this rejection.

Claims 98, 104-105, 108, 126-128, 148 and 152 stand rejected under 35 U.S.C. §103 as allegedly unpatentable over the combined teachings of Gibson, Barisci and Wampler.

Claims 114, 116, 136, 138, and 158 stand rejected under 35 U.S.C. §103 as allegedly unpatentable over the combined teachings of Gibson, Barisci, Mifsud and any of Casella, Thackeray, Naarmann, or Wampler.

Applicants respectfully traverse these rejections.

As mentioned by the Board, Gibson fails to teach or suggest sensor comprising regions of a conductive organic material and regions of a compositionally different conductive material. The Board alleges that Gibson teaches "[a] wide range of conductive polymers may be employed"; "[a] wide range of dopants may be employed"; and that Gibson teaches acidic protein and enzymes may be incorporated. Taken in the absence of the teachings of Applicants' disclosure, Gibson does not teach or suggest the use of any inorganic, carbon black, or inorganic/organic complex as a region of material dispersed in a region of a conductive organic material. In fact, Gibson is not enabling for any material other than polymers. It is well recognized that, for example, glucose oxidase (an enzyme) combined with a polymer material serves as a good amperometric sensor, but are

totally ineffective as a resistometric sensor as suggested by Gibson. Accordingly, Gibson's teachings and suggestions are not sufficient to place or direct a person of skill in the art to utilize other materials as suggested by the Board. In other words the motivation to utilize other materials, particularly inorganic materials, carbon black and the like, can only be arrived at by utilizing Applicants' invention as a blue print.

First, polymer blends and co-polymers are *not* "selected from the group consisting of an inorganic conductor, a carbon black, and a mixed inorganic/organic conductor, wherein the inorganic conductor is a metal, a metal alloy, a metal oxide, a superconductor, or a combination thereof and wherein the inorganic conductor has an electrical conductivity that decreases as the temperature increase" as set forth in Applicants' claimed invention and in fact are far different. There would be no reasonable expectation of success based upon the teachings available in the art at the time the invention was made to foresee the properties of the sensors provided by Applicants' invention comprising a conductive organic material and a compositionally different material selected from the group consisting of an inorganic conductor, a carbon black, and a mixed inorganic/organic conductor, wherein the inorganic conductor is a metal, a metal alloy, a metal oxide, a superconductor, or a combination thereof and wherein the inorganic conductor has an electrical conductivity that decreases as the temperature increase.

Second, "dopants" are not regions of a compositionally different material. In fact, a search of the literature defines a "dopant" of polyaniline (for instance) quite narrowly as an atom that modifies the pi electron in a polymer. As a result a lone electron of a double bond, from which an electron was removed due to the doping, can move easily. As a consequence, the double bond successively moves along the polymer backbone. The positive charge, on the other hand, is fixed by electrostatic attraction to the doping agent, which does not move so readily.

Finally, acidic protein and enzymes are not a compositionally different material selected from the group consisting of an inorganic conductor, a carbon black, and a mixed inorganic/organic conductor, wherein the inorganic conductor is a metal, a metal alloy, a metal oxide, a superconductor, or a combination thereof and wherein the inorganic conductor has an electrical conductivity that decreases as the temperature increase. Rather, as mentioned previously in the various Briefs

submitted by Applicants, an enzyme linked to a polymer serves as an effective amperometric sensor but serves as a non-functional resistometric sensor.

Barisci, Casella, Thackeray, Naarmann and Wampler are provided to overcome the deficiencies of Gibson and the primary reference.

Casella's and Thackerary's sole purpose was to develop an amperometric sensor. As previously discussed, one of skill in the art would not be motivated or even consider amperometric sensors as a source of material for use in resistometric sensor for the reasons the Board elaborated at pages 14-17 of the Decision on Appeal. The systems function in such drastically different ways the one of skill in the art would not consider substituting one material for another or for that matter consider the field of amperometric sensors in constructing a resistometric sensor. In fact most amperometric sensor materials would not function in a resistometric system. What the Office is doing is combining non-analogous art in such a way that it would require one of skill in the art to disregard the principles associated with the technology. Furthermore, based upon the Office's reasoning everything would be obvious simply because the periodic table is known.

Put another way, the position of the Office is akin to saying any new drug is obvious because the periodic chart of elements is available to the skilled person and drugs are made from atoms in the periodic chart, therefore the drug is obvious. Again, Applicants respectfully submit that one of skill in the art would not consider materials used in amperometric sensors as a source of materials for resistometric sensor simply because amperometric sensor are NOT intended to change resistance, whereas resistometric sensor are intended to change resistance. Applicants respectfully submit that Applicants disclosure is being used as a blue-print to combine non-analogous art references.

Wampler teaches that polypyrrole composites are useful for eliminating Cr(VI) in the environment by reducing Cr(VI) to Cr(III) (see, e.g., page 1820). Wampler does not teach or suggest sensors and sensor systems. There is absolutely no reason why one of skill in the art would even consider this reference in arriving at a sensor materials. The reference is directed to a purpose that has nothing to do with sensors, particularly resistometric sensors. There is no teaching or suggestion that any material in Wampler would be useful as a material in either an amperometric-

electrochemical sensor system or in a conductimetric/resistometric sensor system. Applicants respectfully submit that the addition of Wampler, which has nothing to do with sensor systems, is based upon hindsight reconstruction, wherein the Office is picking and choosing among references that have no bearing on sensor systems to arrive at Applicants' invention. Such hindsight reconstruction and picking and choosing among references where there is no suggestion in the art for such combination cannot be done. Applicants respectfully submit that the combination of Gibson, Barisci and Wampler does not provide a prima facie case of obviousness because (1) there is no motivation to combine the references, (2) the combination is based upon hindsight reconstruction utilizing Applicants' disclosure as a blueprint, and (3) even if there was some motivation to combine the references, which there is not, the combination fails to teach or suggest each and every element of Applicants' claimed invention.

Naarmann teaches that the electrochemical polymer material can be used as an electrode or as sensor electrodes in electrochemical storage cells (see English Abstract). The Office alleges at page 12 of the Office Action mailed January 25, 2005, that Naarmann teaches manufacture and use of electrically conductive polymers of five-membered heterocyclic compounds and anions of tetrathiafulvalene derivatives (representing the organic conductor/organic conducting polymer combination). Applicants submit that even if Naarmann teaches such a combination it is irrelevant to Applicants' claims as the compositionally different material in Applicants' invention is selected from an inorganic conductor, a carbon black, and a mixed inorganic/organic conductor. Naarmann does not teach or suggest such inorganic composition mixtures.

Claims 114, 116, 136, 138 and 158 sand rejected under 35 U.S.C. §103(a) in view of the combined teachings of Gibson, Barisci, Mifsud and any of Casella, Thackeray, Naarmann, or Wampler.

Claims 114, 116, 136, 138 and 158 are dependent claims. Mifsud is added to the combination of references discussed *supra* for the alleged teaching of a temperature control. Applicants respectfully maintain that the independent claims are non-obvious over the cited references and thus any claim depending there from is

also non-obvious. Mifsud does little to overcome the deficiencies of the primary reference and secondary references and does little to provide any motivation to combine the non-analogous references related to energy storage, methods of reducing chromium in the environment and amperometric sensors as described in the secondary references.

For, at least, the foregoing reasons the claims submitted herewith are non-obvious over the references either alone or in combination.

For at least the foregoing, the Applicant submits that the claimed invention is patentable and request reconsideration and notice of such allowable subject matter.

The Director is authorized to charge any required fee or credit any overpayment to Deposit Account Number 50-4586, please reference the attorney docket number above.

The Examiner is invited to contact the undersigned at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted,

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